**Math Learning Goals**

- Use circle terminology.
- Measure parts and describe features of a circle.
- Investigate the relationship between the circumference and the diameter of a circle, i.e., $C \div d = \pi$.

Materials

- cylindrical objects
- flexible measuring tape
- string
- calipers
- BLM 3.5.1, 3.5.2
- highlighters

Assessment Opportunities**Minds On ...****Small Groups → Placemat**

Students complete a placemat with the central question: What are some of the different parts and features of a circle? They write a collective response in the centre of the placemat.

Facilitate a whole-class discussion, and then students complete a diagnostic (BLM 3.5.1).

Curriculum Expectations/Quiz/Marking Scheme: Assess prior knowledge of circle terminology (BLM 3.5.1).

[Circles.gsp](#)

When returning diagnostic, highlight where different answers are possible for the same diagram.

Ways to measure circumference:
flexible tape measure,
string/ruler, rolling edge along a ruler

Circles.gsp can be used to demonstrate parts of a circle and construction and measurement of features of a circle.

Students should see that the only possible relationship is $C \div d$.

Action!**Whole Class → Instruction**

Discuss different ways that parts of a circle can be measured, e.g., using a ruler, using The Geometer's Sketchpad®4, using a string/ruler combination.

Discuss how to accurately measure a diameter. Show a pair of calipers. Students think about and suggest how these might be used to measure diameters. Demonstrate how to use calipers to measure the diameter of a circular object.

Pairs → Investigation

Number a collection of objects with circular faces and display them in one location in the classroom. Each pair selects one type of item, e.g., cans, paper plates, cups.

Explain the instructions (BLM 3.5.2), stressing careful measurement. Students record their observations to the nearest tenth. Students exchange the item after measuring it. They take measurements for at least six items before starting the calculations.

Consolidate Debrief**Whole Class → Summarizing**

Compare the data collected. Remeasure and recalculate data that doesn't seem to fit. Discuss responses to question 6. Guide students to see that there is a relationship between the circumference and diameter.

Home Activity or Further Classroom Consolidation

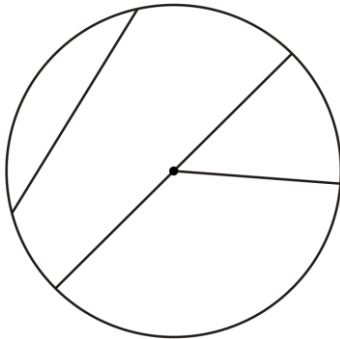
Find other circular objects that have a very large diameter, e.g., vehicle tire, tree stump. Confirm that the relationship works for these objects.

*Concept Practice
Differentiated
Exploration*

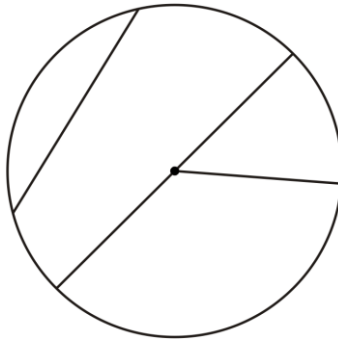
3.5.1: Looking at Circles

Highlight the indicated feature on each diagram.

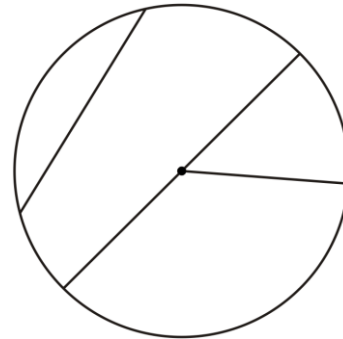
centre



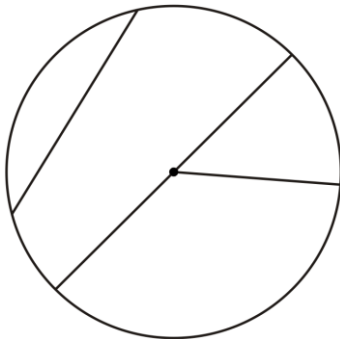
radius



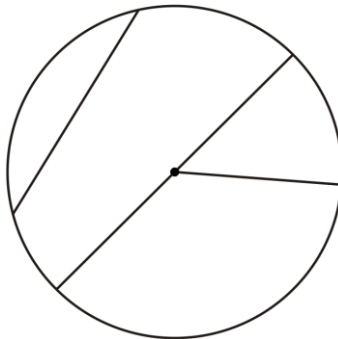
diameter



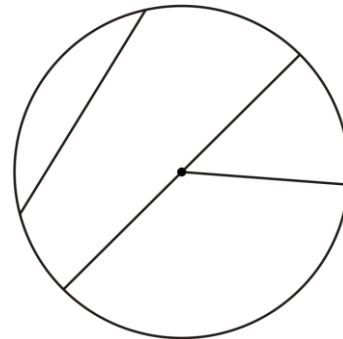
chord



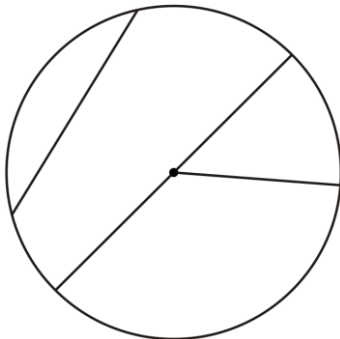
circumference



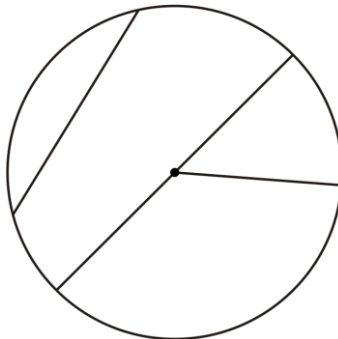
area



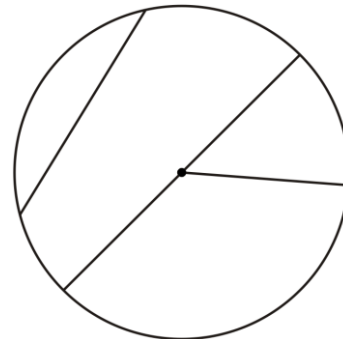
arc



sector



segment



3.5.2: Exploring Relationships within the Circle

1. Select an object with a circular face.
2. Measure the circumference (C) to the nearest 0.1 cm. Record the measurement.
3. Measure the diameter (d) to the nearest 0.1 cm. Record the measurement.
4. Repeat the first three steps with different objects.
5. Do the calculations indicated in the chart. Use a calculator and round answers to the nearest one-hundredth.

Object	C	d	Calculations			
			$C - d$	$C + d$	$C \div d$	$C \times d$

6. Examine the four Calculations columns. Describe any patterns that you see.

Circles (GSP® 4 file)

[Circles.gsp](#)

Circles

Show me

Radius = 2.0 cm

Show me

Diameter = 4.0 cm

Show me

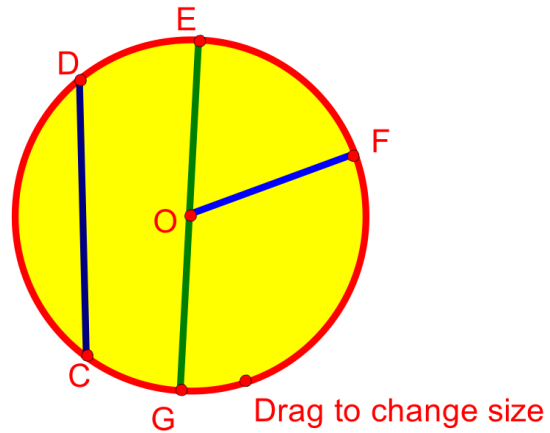
Circumference = 12.6 cm

Show me

Area = 12.7 cm²

Show me

Chord = 3.2 cm



Questions:

- 1) Is there a numerical relationship between the lengths of the diameter and radius?
- 2) Is a diameter also a chord?

Show me